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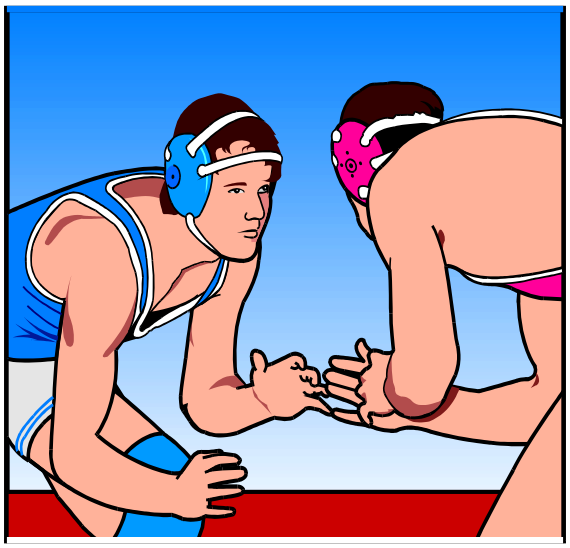
Outbreak Investigation – Rash Among High School Wrestlers in Utah, Winter 2004



The Utah Department of Health (UDOH) was notified of a cluster of rashes among wrestlers at a single rural high school on January 14, 2004. Approximately 50% of the team had broken out with rashes in the previous four days. The team had recently competed in two large tournaments, including one that featured 32 teams from three states.

While rashes among wrestlers are not uncommon, onset of rash among so many athletes at once suggested that something unusual might have occurred. UDOH issued guidelines about control of skin infections and began an investigation. The purpose of the investigation was to determine if the cluster represented an outbreak and to discover risk factors for developing rash so that more specific recommendations could be made to prevent infection.

The first step in the investigation of an outbreak is to confirm the diagnosis. It is important to make sure that the group of possible outbreak cases is actually experiencing the same illness. This is especially important for an outbreak defined by a symptom, such as presence of rash, because there are many possible causes of rash. In this instance, the initial report did not indicate what was causing the boys' rashes. Only a few of them had seen a physician, and laboratory results for the few samples that had been taken weren't available yet. Several possible causes of the wrestlers' rashes were considered, including exposure to a chemical such as a solution used to disinfect the wrestling mats. Infectious agents, such as herpes simplex virus (cold sores – given the special name of herpes gladiatorum when they occur outside of the usual area of the lips or genitalia), streptococcal bacteria, varicella zoster virus (chickenpox), and other bacterial and viral infections were also considered. Laboratory findings and diagnosis of cases in this investigation are discussed further below.

Another important early step in an outbreak investigation is to determine whether or not the number of reported cases really represent an outbreak. In other words, to evaluate the question, "are there more cases of this disease than would normally be expected in this population during this time period?" A single case of human rabies or cholera in Utah could be considered an outbreak because historically, no cases are expected. On the other hand, during influenza season, hundreds of cases are expected based on historical data. To be deemed an outbreak, more cases than are expected for the "influenza season" time period would have to be reported. There are no data routinely collected on the incidence of rash (due to any cause), or in this case on incidence of rash among wrestlers, so this situation presented a dilemma – how to decide if there were more cases than expected in the absence of historical data. In this situation, it was decided that subjective judgment of both a wrestling coach at an affected school and a local nurse would be used to determine if the situation was unusual for that school/area.

In order to determine what exposure could possibly have caused an outbreak, it is necessary to compare the exposure experience of cases, or people who experience disease, with controls, or people who do not experience disease. Previously reported outbreaks of skin infections among athletes have implicated shared equipment such as whirlpools, and behaviors such as body shaving, as important modes of transmission. A questionnaire was developed for wrestlers and coaches that asked about these types of exposures and behaviors, as logically they may have been associated with acquiring rash. For example, questions were asked regarding history of experiencing wounds or 'mat burns' when wrestling and how the wounds were treated, hygiene practices such as showering habits and sharing clothing or personal items with teammates, equipment maintenance practices for washing of uniforms and helmets, etc., and availability and use of shared training facilities with amenities such as whirlpools or saunas. The survey was also used to assess the nature of the rash in those affected to

help better characterize the rashes and determine if they seemed to be due to a common etiology (again, to verify the diagnosis and assess if an outbreak was in fact occurring).

Completed surveys were obtained from 246 wrestlers and contacts at 29 schools over the course of about three weeks. There was some difficulty with participant compliance, as rashes are seen as part of life for wrestlers. Some athletes, coaches, and parents didn't understand why this issue was being investigated. Further, many wrestlers and their parents were reluctant to answer questions because they were worried about being excluded from participation as the state tournament approached.

Rash of any kind was reported by 59 respondents (24%). Laboratory results were only available for 10 of the 59 wrestlers who reported rash. Laboratory results indicated multiple rash etiologies including Group A Streptococcus (non-invasive), herpes simplex virus, and Staphylococcus aureus. Clinical diagnoses also included ringworm, cellulitis, and impetigo. Among wrestlers who had reported any rash, 33 (56%) reported a rash that had been diagnosed as herpes or described lesions that would be clinically consistent with herpes gladiatorum infection.

Without knowing the usual rate of rash among wrestlers, it was hard to decide if the situation represented an isolated outbreak at the school reporting the problem, or if it represented a statewide increase in rash. Based on the differences in rash attack rate, proportion of rashes that were diagnosed as herpes, and the clustering of onset dates at the first school reporting rash, it was decided that two phenomena were probably occurring – an outbreak of rash at one school that appears to have been caused by herpes, and other cases of rash at additional schools that were detected because of active surveillance for possible cases, but that may not have been related to the outbreak at the first school.

Common behaviors among wrestlers may have contributed to the incidence and spread of rash. For example, most wrestlers did not shower in the locker room following wrestling practice or a meet. Among all respondents, 72% delayed post-practice showering and 60% delayed post-meet showering until returning home. Most wrestlers reported that they washed their uniform before re-wearing it (59%), which implies that 41% of wrestlers wore their uniform again without washing. Nearly half of all wrestlers reported sharing personal items such as towels or grooming products with teammates in the locker room (48%). The schools involved in the outbreak were mostly rural and lacked training amenities such as whirlpools, eliminating use of these facilities as a possible route of exposure in this instance.

UDOH looked to the National Federation of State High Schools (NFHS) via the UHSAA (Utah High School Activities Association) to acquire recommendations about rashes and wrestling. Information from the NFHS Sports Medicine publication was posted on the UDOH website. This publication included information for physicians with specific guidance on diagnosis, treatment, and length of time that a player must be on appropriate therapy prior to being given permission to play after contracting a rash. Recommendations for environmental sanitation (cleaning of wrestling mats) and exclusion of athletes with skin lesions from play existed prior to the outbreak. UDOH issued a reminder that established sanitation and exclusion guidelines should be followed.

In summary, an apparent common-source outbreak of rash at a single high school was investigated. Based on clinical presentation and laboratory findings, the outbreak seemed to be due to herpes. Active surveillance identified additional cases at other schools, however, these cases may have been unrelated and due to other etiologies. During the course of the investigation, it was discovered that rash is considered to be a common occurrence among wrestlers and that the background rate of rash is unknown. It was not possible to identify the source of exposure for the apparent outbreak. Established hygienic guidelines should be followed by high schools with wrestling teams as they may prevent future outbreaks, and athletes with lesions should be excluded from competition and practice. This investigation was a good exercise in cooperation between the Utah Department of Health and partners such as local health departments and affected high schools.

2004 Communicable Disease Rule Changes

The control of communicable diseases in Utah depends on a timely, sensitive, and accurate surveillance system based on the reporting of legally notifiable diseases as outlined in the Communicable Disease Rule (R386-702). As part of an effort to protect the health of the citizens of Utah from the threat of infectious diseases, the Utah Department of Health has made several revisions to the Rule in 2004. The major revisions include a change in disease reporting times, the addition of new diseases to the list of reportable diseases, and the authorization for public health to require the reporting of syndromes during a public health emergency.

All diseases not required to be reported immediately or monthly (e.g., number of cases of MRSA or vancomycin resistant enterococci [VRE]) are required to be reported within **three working days** from the time of identification. Previously, reports were required to be received within seven calendar days of identification of a possible case.

The following conditions were added to the reportable diseases list:

- Adverse event resulting after smallpox vaccination
- Arbovirus infection
- Creutzfeldt-Jakob disease and other transmissible human spongiform encephalopathies
- Dengue fever
- Enterohemorrhagic *Escherichia coli* (EHEC) infection, including *Escherichia coli* O157:H7
- Hepatitis C, acute and chronic infection
- Norovirus, formerly called Norwalk-like virus, infection
- St. Louis encephalitis
- Severe Acute Respiratory Syndrome (SARS)
- Smallpox
- *Staphylococcus aureus* with resistance or intermediate resistance to vancomycin isolated from any site
- *Staphylococcus aureus* with resistance to methicillin (MRSA) isolated from any site
- Viral hemorrhagic fever
- West Nile virus infection

These additions are reflected in the list of diseases that are required to be reported **immediately** by telephone:

- Anthrax
- Botulism
- Cholera
- Diptheria
- *Haemophilus influenzae* (invasive disease)
- Measles
- Meningococcal disease
- Pertussis
- Plague
- Poliomyelitis
- Rabies
- Rubella
- **SARS**
- **Smallpox**
- Syphilis
- Tuberculosis
- Tularemia

- Typhoid
- **Viral hemorrhagic fever**
- Yellow fever

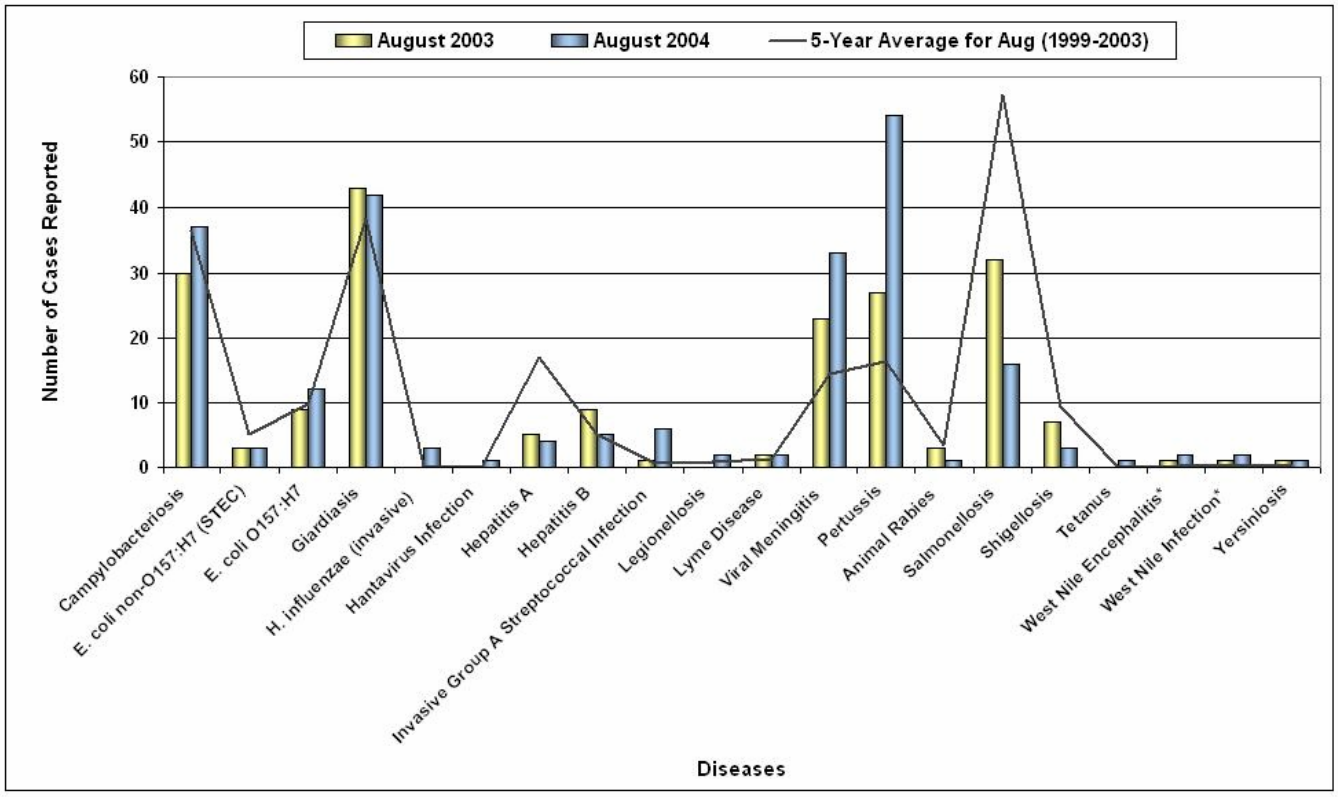
The updated rule also authorizes public health to make the following syndromes reportable during a public health emergency:

- Respiratory illness
- Gastrointestinal illness
- Influenza-like illness
- Neurologic symptoms or signs indicating the possibility of meningitis, encephalitis, or unexplained acute encephalopathy or delirium
- Rash illness
- Hemorrhagic Illness
- Botulism-like syndrome
- Lymphadenitis
- Sepsis or unexplained shock
- Febrile illness
- Non-traumatic coma or sudden death

The entire rule, including additional revisions not included in this summary, may be viewed by clicking on the following link: http://health.utah.gov/els/epidemiology/commdisease/R386-702/Rule_386-702_061104.pdf

The Cumulative Number of Suspect, Probable, and Confirmed Diseases by Health District
Utah, August 2004

Health District	Campylobacteriosis	*E. coli non-O157:H7* (STEC)	*E. coli O157:H7*	Giardiasis	*H. influenzae* (invasive)	Hantavirus Infection	Hepatitis A	Hepatitis B	Invasive Group A Streptococcal Infection	Legionellosis	Lyme Disease	Viral Meningitis	Pertussis	Animal Rabies	Salmonellosis	Shigellosis	Tetanus	West Nile Encephalitis*	West Nile Infection*	Yersiniosis
Bear River	1		4				1						12		2					1
Central	4			5		1						1			1					
Davis	2		1	2								4	1		2			1		
Salt Lake	13	2	4	18	3		2	3	3		2	18	32	1	8	2	1		1	
Southeast	2						1								1					
Southwest	4			2				1		2		1			1					
Summit				1									1							
Tooele				2					1			3								
Tricounty				1														1		
Utah County	6		1	6				1	1			6	1		1	1			1	
Wasatach	1			2																
Weber-Morgan	4	1	2	3					1				7							
August 2004	**37**	**3**	**12**	**42**	**3**	**1**	**4**	**5**	**6**	**2**	**2**	**33**	**54**	**1**	**16**	**3**	**1**	**2**	**2**	**1**
August 2003	30	3	9	43	0	0	5	9	1	0	2	23	27	3	32	7	0	1	1	1
5-Year Average for Aug (1999-2003)	36.4	5	9.8	38.4	0.2	0	17	5	0.6	0.8	1.2	14.4	16.4	3.4	57.2	9.4	0	0.2	0.2	0.2
Cases per 100,000 population (Aug 2004)	1.53	0.12	0.50	1.74	0.12	0.04	0.17	0.21	0.25	0.08	0.08	1.37	2.24	0.04	0.66	0.12	0.04	0.08	0.08	0.04
2004 To Date	226	16	25	201	13	1	36	33	34	15	9	61	105	5	156	27	3	3	4	1
2003 To Date	164	20	36	230	11	3	27	42	27	13	5	64	100	9	149	38	1	1	2	0
	Statistically signfificant increase in reported cases for August																			
*5-year data unavailable																				



The Cumulative Number of Suspect, Probable, and Confirmed Diseases by Health District
Utah, September 2004

Health District	Brucellosis	Campylobacteriosis	Coccidioidomycosis	*E. coli* O157:H7	Giardiasis	Hepatitis A	Hepatitis B	Influenza	Legionellosis	Lyme Disease	Non-bacterial Meningitis	Meningococcal Disease	Pertussis	Animal Rabies	Salmonellosis	Shigellosis	West Nile Encephalitis	West Nile Infection	Yersiniosis
Bear River		8			1						1		7		1	2			
Central		1			3								1						
Davis		3		2	5	1					3		3		2	1			
Salt Lake County	1	7	1	6	15	3	1	6	1	2	25		24		17	2			
Southeast		2			1			1						1					
Southwest		4	4	1	6				1				1		1		1	1	
Summit					1														
Tooele											1	1	1						
Tricounty					2								1	1				1	
Utah County		11			12			2					4	1	5				
Weber-Morgan	1		1	2	6	1					10		9		1				1
September 2004	**2**	**36**	**6**	**11**	**52**	**5**	**1**	**9**	**2**	**2**	**40**	**1**	**51**	**3**	**27**	**5**	**1**	**2**	**1**
September 2003	0	33	3	15	55	8	2	0	3	0	87	0	23	5	29	2	0	2	0
5-Year Average for Sept (1999-2003)	0.2	40.8	2.2	10.4	45.2	12.8	3.0	0.2	1.8	0.6	26.6	0.0	12.2	3.4	37.0	5.4	*	*	0.6
Cases per 100,000 population (Sept 2004)	**0.1**	**1.5**	**0.2**	**0.5**	**2.2**	**0.2**	**0.0**	**0.4**	**0.1**	**0.1**	**1.7**	**0.0**	**2.1**	**0.1**	**1.1**	**0.2**	**0.0**	**0.1**	**0.0**
2004 To Date	3	262	28	36	252	41	34	470	17	11	120	5	156	8	183	32	4	5	5
2003 To Date	2	197	13	51	285	35	44	706	16	5	154	2	123	14	178	40	1	3	2

Statistically significant increase in number of reported cases for September

* 5-year data unavalaible